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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/652,820	08/31/2000	John Oliensis	13725	4355
20844	7590	01/18/2005	EXAMINER	
NEC LABORATORIES AMERICA, INC.			KIBLER, VIRGINIA M	
4 INDEPENDENCE WAY			ART UNIT	
PRINCETON, NJ 08540			PAPER NUMBER	
			2623	

DATE MAILED: 01/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/652,820

Applicant(s)

OLIENSIS, JOHN

Examiner

Virginia M Kibler

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/9/4 has been entered.

Response to Amendment

2. The amendment received on 12/9/04 has been entered. New claims 20-23 have been added. Claims 16-23 remain pending.

Response to Arguments

3. Applicant's arguments filed 12/9/04 have been fully considered but they are not persuasive.

Summary of Applicant's Argument: The Irani paper does not disclose utilizing geometric restrictions to simplify the computational complexity in the manner of the present invention. There is no suggestion to utilize the linear motion of the successive image data to decompose a shift data representation into a motion vector and a structure vector which can be solved by computing a projection matrix that is block diagonal between different smoothing

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windows. The Oliensis 1996 paper does not specifically disclose how to extend the original technique to incorporate image intensity data.

Examiner's Response: Irani is not relied on for utilizing the linear motion of the successive image data. Oliensis discloses recovery of a scene structure from successive image data where motion of the scene structure is linear (Abstract). While Oliensis discloses using point features, Oliensis recognizes using intensity data (Reference 10, "Oliensis in preparation"). The algorithm is for point features but easily extends to a direct method based on image intensities. The combined teachings of Oliensis and Irani meet the claimed language.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 16-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oliensis ("Structure from Linear or Planar Motion," IEEE 1996) and Irani ("Multi-Frame Optical Flow Estimation Using Subspace Constraints"):

Regarding claims 16 and 20, Oliensis discloses computing rotational motion in the successive image data using rotational flow vectors derived from tracked points collected from the successive image data (Sect. 2), constructing a shift data matrix for the tracked points that compensates for the rotational motion in the successive image data (Sect. 2), and decomposing

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the shift data matrix into motion vector (Sect. 2.1-2.2) and a structure vector (Sect. 2.2.1) and computing a projection matrix for recovering the scene structure by solving for the structure vector (Sect. 2.3.1). Oliensis recognizes using intensity data (Reference 10, "Oliensis in preparation", the algorithm is for point features but easily extends to a direct method based on image intensities), but does not specifically disclose dividing the successive image data into smoothing windows, and computing a projection matrix which is block diagonal between different smoothing windows. However, Irani discloses reconstructing scene structure using intensity (Sect. 3), dividing the successive image data into smoothing windows (Sect. 3.2), and computing a projection matrix which is block diagonal between different smoothing windows and which is used to recover the scene structure (Sect. 4). Oliensis and Irani are combinable because they are from the same field of endeavor of scene reconstruction. At the time of the invention, it would have been obvious to one of ordinary skill in the art to have modified the recovering of scene structure disclosed by Oliensis to include using intensity data and dividing the image data into smoothing windows. The motivation for doing so would have been because it is well known in the art and provides an estimation of optical-flow across multiple frames using measurable image quantities. Therefore, it would have been obvious to combine Oliensis with Irani to obtain the invention as specified in claim 16.

Regarding claims 17 and 21, Oliensis discloses the shift data representation is decomposed using SVD (Sect. 2.2.1).

Regarding claims 18 and 22, Oliensis discloses wherein SVD is used to compute a rank-1 factorization (Sect. 2.2.1).


Regarding claims 19 and 23, Oliensis discloses the method is iterated until it converges to a reconstruction of the scene structure (Sect. 2.2.3).

Contact Information

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Virginia M Kibler whose telephone number is (703) 306-4072. The examiner can normally be reached on Mon-Thurs 8:00 - 5:30 and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Virginia Kibler can be reached on (703) 306-4072. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Virginia Kibler
1/12/05

**MEHRDAD DASTOURI
PRIMARY EXAMINER**

